Maine Department of Transportation

Highway Program

Design Guidance

Title: Open Channel Flow Hydraulics	Issue Date: November 2, 2021
Discipline: Highway Engineering	
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Background:

Open channel flow refers to water with a 'free surface' exposed to the atmosphere, typically flowing through ditches and channels. This guidance works through how to design ditches to meet Maine DOT's hydraulic design standards using Federal Highway Administration's (FHWA) Hydraulic Toolbox Software Application. Other references used include Hydraulic Design Series (HDS) 4 & 5 and Hydraulic Engineering Circular (HEC) 15 & 22.

Guidance:

Open Channels

The H&H engineer should be contacted for ditch design from 4%-6% when deciding between Erosion Control Blanket and Stone Ditch Protection, when the ditch exceeds a 9% slope, carries more than 10 cfs, or is a large drainage run (area > 30 acres). The Environmental Office should be contacted when the ditch carries a stream. For ditch design, the design flow considered is the 10-year return period (Q_{10}); if a stream is carried the design flow is the 50-year return period (Q_{50}).

Consider areas of recent or potential future development to understand how new flow may impact the ditch.